further example, a tab structure having hook structures may be attached to the ears 18 of the waist region 14 and made securable to loop members found on the front waist region 12. Such a "hook and loop" concept (and other generally known fastening structures) is generally known and practiced in the art and may be incorporated into the present invention design by one skilled in the art having access to the disclosure provided herein.

The diaper 10 of the present invention also features one or more longitudinally stretchable elastic members or leg elastics 32 positioned adjacent each of the two side edges 90 of the diaper 10 (see FIG. 3). When the diaper 10 is properly worn by the wearer, each leg elastic 32 encircles a leg of the wearer and provides a quasi-seal thereabout which substantially prevents leakage from the interior of the diaper 10. Such leg elastics 32 may be applied in the stretched or extended condition. In one application of invention, the elastics 32 are placed between the topsheet 50 and the backsheet 40 in the stretched condition, and, then, attached to one or both of the sheets 50, 40 (i.e., by glue or other adhesive). When subsequently released, the elastics 32 retract and form barrier cuffs, gathered leg regions or leg gatherers 36 as it pulls adjacent material therewith (see also FIGS. 1 and 2).

Now referring primarily to the exploded view of FIG. 3, a diaper 10 according to the invention typically features two to five layers. These five layers include a non-woven backsheet 40, a film barrier 42, a core 46, a topsheet 50, and a pair of end strips or tensioner members 80 disposed above the topsheet 50. FIG. 4 provides a cross-sectional view that depicts all five layers and their respective structural relationships. In an alternative embodiment, the diaper 10 may include an acquisition layer disposed between the core 46 and the topsheet 50 (such a construction is described in more detail below). In yet another embodiment, the inventive diaper may utilize a multipurpose material as one of

(i.e., at an angle) away from the topsheet 50. As best shown in the cross sectional view of FIG. 4, the soffit section 80c extends inwardly to the extent that it is over a longitudinal edge portion 46a of the core 46.

In one aspect of the invention, substantially all of the central portion of the soffit section 80c is free from and is spaced from the top sheet 50, while the side portions or lateral edges of the soffit section 80c are secured to the top sheet 50 and the distal edges 36a of the leg gathers 36. As a result, the tensioner 80 functions to pull at least the intermediate portions of the side edges 90 or, more appropriately, the regions of the side edges (including the leg gathers 36) upwardly (by applying a contractile force across the waist region 16). These side edge regions are biased or brought to and maintained in an upstanding position along the crotch region 16 (see, e.g., FIGS. 1 and 3), to form upright side wall structures or side walls. As will be further explained below, these upstanding wide walls perform a containment or sealing function, as well as enhance the fit and comfort of the diaper 10.

As best shown in FIG. 1, the diaper 10 takes on an hourglass shape that is particularly advantageous to the fit and sealing ability of the diaper 10. This fit is further enhanced by the upstanding disposition of the leg gathers 36 (provide side walls) and the tension provided in the front and back waist regions 12, 14 by the tensioner 80. Another advantage provided by the inventive diaper design is that the hourglass shape of the diaper may be attained without having to cut leg openings into the composite web structure during the manufacturing process.

In yet another aspect of the invention, the combination of the upstanding side walls (including the barrier cuffs or leg gathers 36) and the elasticized soffit section 80c on both the front waist region 12 and the back waist region 14 of the

diaper creates a retention compartment or containment pocket 96 at the crotch section region 16. This retention compartment 96 is generally deeper than conventional containment or central core areas. The retention compartment 96 may be characterized as having a depth dimension generally equal to the vertical distance CC or the vertical distance between the inward edge 80d and the average elevation of the top surface of the core 46. This depth dimension CC is generally greater than about 1/4" and up to about 4", but preferably will be between 3/4" and 2" (as measured when the diaper 10 is in the flat, extended condition). The upstanding leg gathers 36 serve as one set of retaining sidewalls for the retention compartment 96 while the oppositely-facing elasticized soffit sections 80c serve as retaining end walls of the retention compartment 96. The elasticized soffit sections 80c are, in one regard, particularly adapted to provide such a function because it extends upwardly and well above the core 46. Thus, the retention compartment 96 may be referred to as having at least two elastic wall sections and at least two intermediate wall sections each disposed between elastic wall sections. In alternative embodiments, the wall sections may be disposed in other areas of the article 10. The relatively deep retention compartment 96 of the present invention provides an improved structure and means for receiving and retaining body exudates in the central portion of the diaper 10. It should be noted, however, that the design of a deep retention compartment 96 is also applicable and advantageous in other disposable articles or garments 10.

In alternative embodiments of the present invention, the end strip may consist of more or less than three distinct sections. Further, the sections of the end strip may not be necessarily formed from the same material. Further yet, the end strip may be formed integrally as one piece with the topsheet or may include a portion of the topsheet. Additionally, the end strip may not necessarily be disposed adjacent the end edges and, in partially forming a containment wall of a

Topsheet

The topsheet 50 in FIGS. 1-4 may be constructed from any one of a wide range of liquid and vapor permeable hydrophilic materials. The topsheet may consist of or include non-woven webs of natural fibers (e.g., wood or cotton) or synthetic fibers (e.g., polypropylene or polyester), a combination of such webs or fibers, or apertured film. One suitable topsheet material is a 15 gsm spunbond polypropylene from Avgol Non-wovens of Holon, Israel. In addition, the topsheet may be treated with a surfactant to facilitate liquid transfer, especially at a central zone or area of the topsheet located over the core and an inner surface of the topsheet may be treated with a chemical to increase the surface tension of liquids which pass through it.

In the embodiment of FIGS. 1-4, the topsheet 50 is formed from a single piece or sheet of material that covers substantially the entire area of the disposable absorbing article 10, including substantially all of the front waist region 12, back waist region 14, and crotch region 16. Further, ear region 18 of disposable absorbent article 10 is formed from the same single topsheet material and, thus, may be referred to as being unitary with and forming lateral extensions of the topsheet material.

Alternatively, the topsheet may be formed from multiple different materials, which vary across the width of the topsheet. Such a multiple piece design allows for the creation of preferred properties in different zones of the topsheet. For example, the topsheet may comprise a center section above the absorbent core that is made of a hydrophilic material and a pair of leg cuff sections that are formed substantially from a hydrophobic material.

Absorbent Core

The absorbent core 46 of FIGS. 1-4 is generally centered about the longitudinal axis AA and lateral axis BB of the diaper 10, and is firmly secured